查询AOL1440L供应商

ALPHA & OMEGA SEMICONDUCTOR

AOL1440
N-Channel Enhancement Mode Field Effect Transistor

General Description

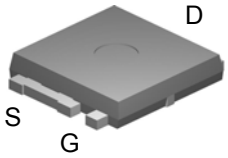
The AOL1440 uses advanced trench technology to provide excellent $R_{DS(ON)}$, shoot-through immunity and body diode characteristics. This device is ideally suited for use as a low side switch in CPU core power conversion. *Standard Product AOL1440 is Pb-free (meets ROHS & Sony 259 specifications). AOL1440L is a Green Product ordering option. AOL1440 and AOL1440L are electrically identical.*

Features

V_{DS} (V) = 25V
I_D = 75A (V_{GS} = 10V)
$R_{DS(ON)}$ < 3.2mΩ (V_{GS} = 20V)
$R_{DS(ON)}$ < 4.0mΩ (V_{GS} = 12V)
$R_{DS(ON)}$ < 5.2mΩ (V_{GS} = 10V)

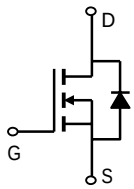
UIS Tested
Rg,Ciss,Coss,Crss Tested

Ultra SO-8™ Top View



Bottom tab connected to drain

Fits SOIC8 footprint !



Absolute Maximum Ratings T_A=25°C unless otherwise noted

Parameter		Symbol	Maximum	Units
Drain-Source Voltage		V_{DS}	25	V
Gate-Source Voltage		V_{GS}	±30	V
Continuous Drain Current [B,G,]	T_C=25°C [G]	I_D	85	A
	T_C=100°C [B]		66	
Pulsed Drain Current		I_{DM}	200	
Continuous Drain Current [G]	T_A=25°C	I_{DSM}	25	A
	T_A=70°C		20	
Avalanche Current [C]		I_{AR}	30	A
Repetitive avalanche energy L=0.3mH [C]		E_{AR}	135	mJ
Power Dissipation [B]	T_C=25°C	P_D	75	W
	T_C=100°C		37	
Power Dissipation [A]	T_A=25°C	P_{DSM}	5	W
	T_A=70°C		3	
Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 175	°C

Thermal Characteristics

Parameter		Symbol	Typ	Max	Units
Maximum Junction-to-Ambient [A]	t ≤ 10s	$R_{\theta JA}$	19	25	°C/W
Maximum Junction-to-Ambient [A]	Steady-State		45	55	°C/W
Maximum Junction-to-Case [C]	Steady-State	$R_{\theta JC}$	1.5	2	°C/W

Electrical Characteristics (T_J=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
STATIC PARAMETERS						
BV_{DSS}	Drain-Source Breakdown Voltage	I_D=250µA, V_{GS}=0V	25			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=20V, V_{GS}=0V		0.005	1	µA
		T_J=55°C			5	
I_{GSS}	Gate-Body leakage current	V_{DS}=0V, V_{GS}= ±30V			100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS} I_D=250µA	2	3	4	V
$I_{D(ON)}$	On state drain current	V_{GS}=12V, V_{DS}=5V	200			A
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=20V, I_D=20A		2.7	3.2	mΩ
		V_{GS}=12V, I_D=20A		3.5	4	
		V_{GS}=10V, I_D=20A		4	5.2	mΩ
		T_J=125°C		5.6		mΩ
g_{FS}	Forward Transconductance	V_{DS}=5V, I_D=20A		75		S
V_{SD}	Diode Forward Voltage	I_S=1A,V_{GS}=0V		0.7	1	V
I_S	Maximum Body-Diode Continuous Current				55	A
DYNAMIC PARAMETERS						
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=12.5V, f=1MHz		2100	2400	pF
C_{oss}	Output Capacitance			850		pF
C_{rss}	Reverse Transfer Capacitance			400		pF
R_g	Gate resistance	V_{GS}=0V, V_{DS}=0V, f=1MHz		0.35	1	Ω
SWITCHING PARAMETERS						
Q_g(12V)	Total Gate Charge	V_{GS}=10V, V_{DS}=12.5V, I_D=20A		40	50	nC
Q_g(10V)	Total Gate Charge			33		nC
Q_{gs}	Gate Source Charge			11		nC
Q_{gd}	Gate Drain Charge			14		nC
$t_{D(on)}$	Turn-On DelayTime	V_{GS}=10V, V_{DS}=12.5V, R_L=0.68Ω, R_{GEN}=3Ω		12		ns
t_r	Turn-On Rise Time			19		ns
$t_{D(off)}$	Turn-Off DelayTime			15		ns
t_f	Turn-Off Fall Time			8.5		ns
t_{rr}	Body Diode Reverse Recovery Time	I_F=20A, dI/dt=100A/µs		42		ns
Q_{rr}	Body Diode Reverse Recovery Charge	I_F=20A, dI/dt=100A/µs		34		nC

A: The value of $R_{\theta JA}$ is measured with the device in a still air environment with T_A =25°C.

B. The power dissipation P_D is based on $T_{J(MAX)}$=175°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.

C: Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=175°C.

D. The $R_{\theta JA}$ is the sum of the thermal impedence from junction to case $R_{\theta JC}$ and case to ambient.

E. The static characteristics in Figures 1 to 6 are obtained using <300 µs pulses, duty cycle 0.5% max.

F. These curves are based on the junction-to-case thermal impedence which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of $T_{J(MAX)}$=175°C.

G. The maximum current rating is limited by bond-wires.

H. These tests are performed with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The SOA curve provides a single pulse rating.

Rev0. July 2006

THIS PRODUCT HAS BEEN DESIGNED AND QUALIFIED FOR THE CONSUMER MARKET. APPLICATIONS OR USES AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS ARE NOT AUTHORIZED. AOS DOES NOT ASSUME ANY LIABILITY ARISING OUT OF SUCH APPLICATIONS OR USES OF ITS PRODUCTS. AOS RESERVES THE RIGHT TO IMPROVE PRODUCT DESIGN, FUNCTIONS AND RELIABILITY WITHOUT NOTICE.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

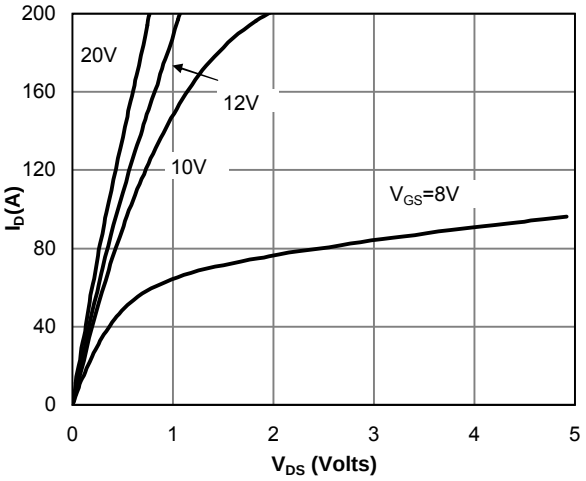


Figure 1: On-Region Characteristics

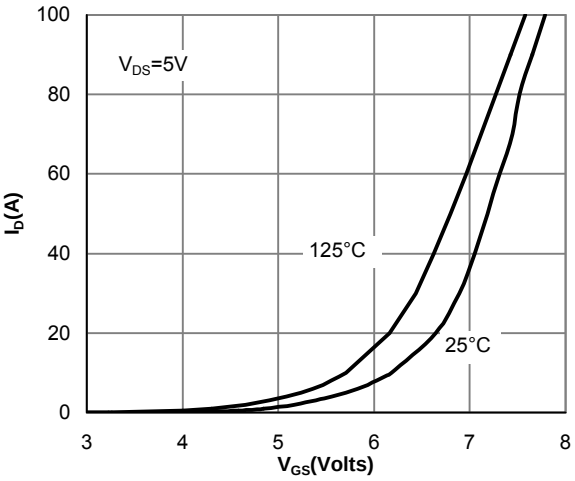


Figure 2: Transfer Characteristics

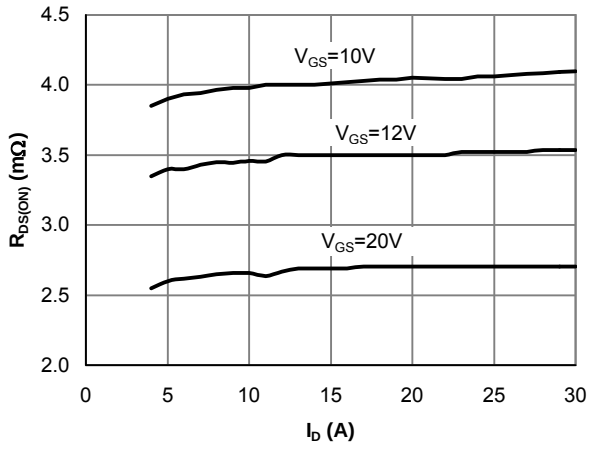


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

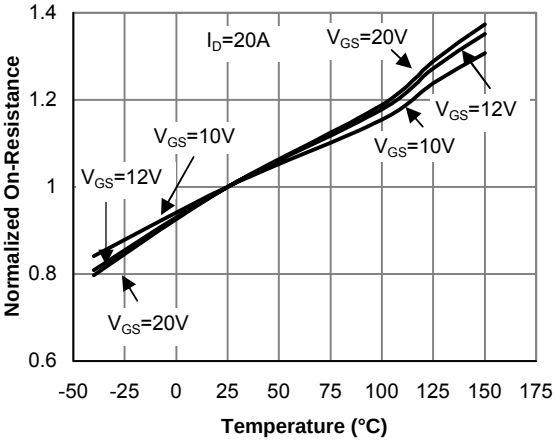


Figure 4: On-Resistance vs. Junction Temperature

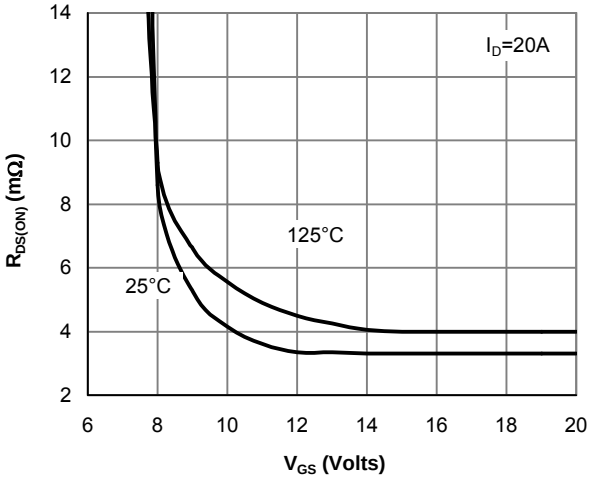


Figure 5: On-Resistance vs. Gate-Source Voltage

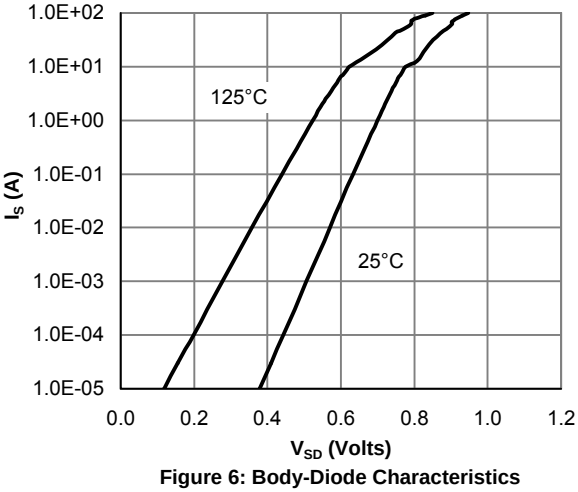


Figure 6: Body-Diode Characteristics

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

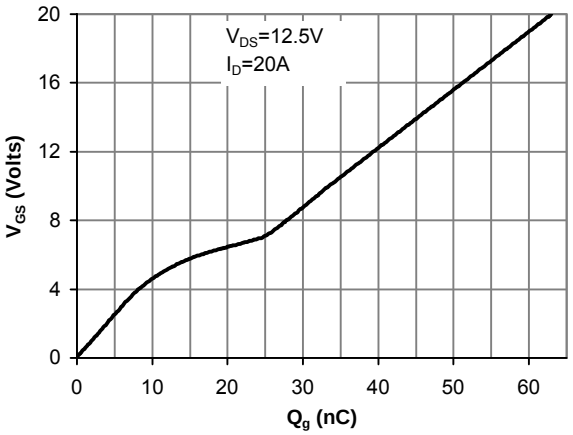


Figure 7: Gate-Charge Characteristics

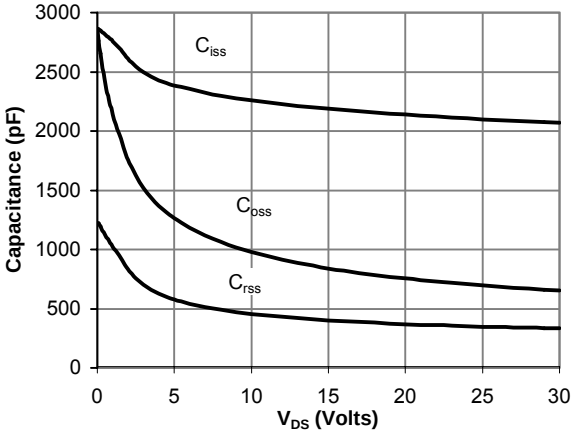


Figure 8: Capacitance Characteristics

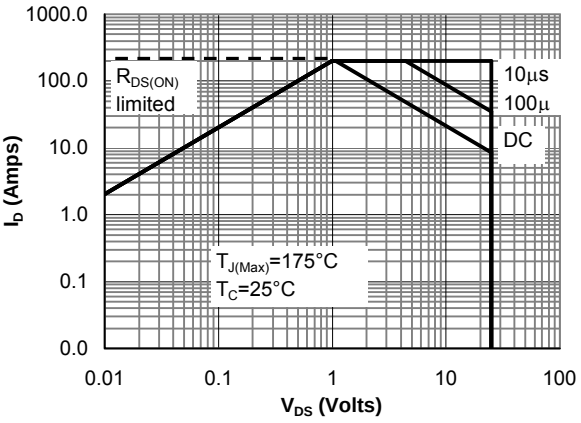


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

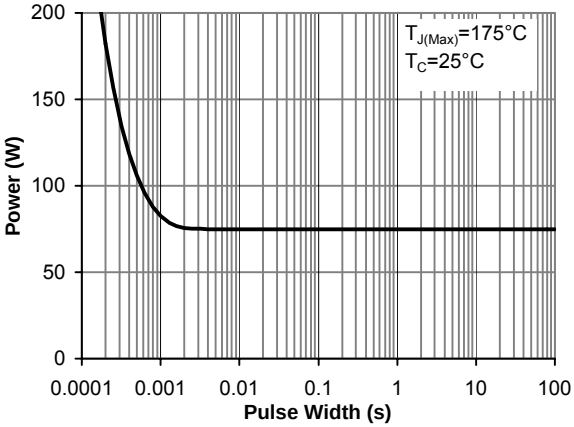


Figure 10: Single Pulse Power Rating Junction-to-Case (Note F)

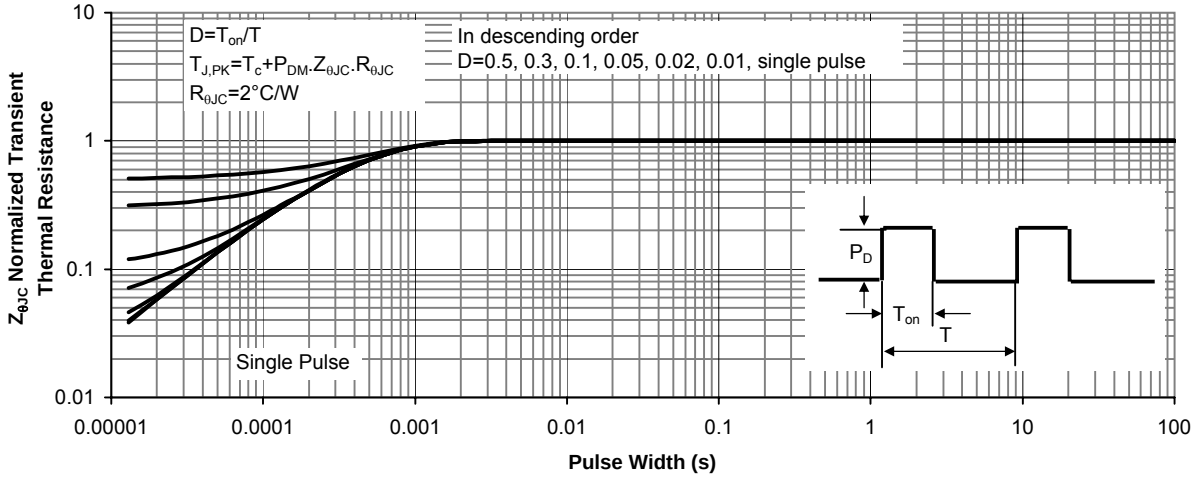


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

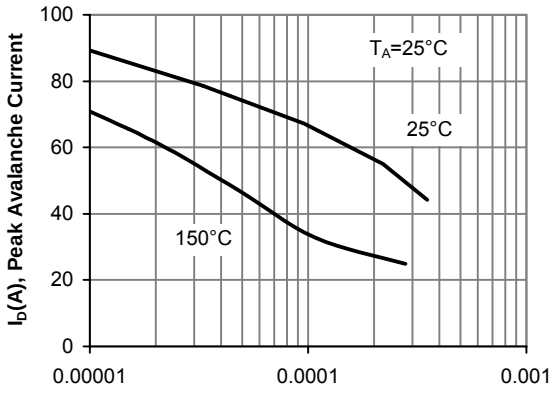


Figure 12: Single Pulse Avalanche capability

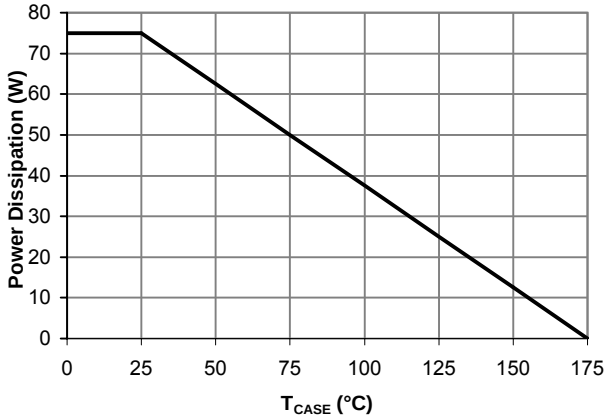


Figure 13: Power De-rating (Note B)

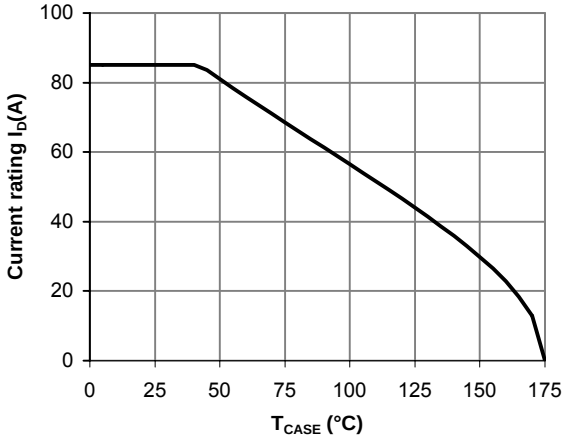


Figure 14: Current De-rating (Note B)

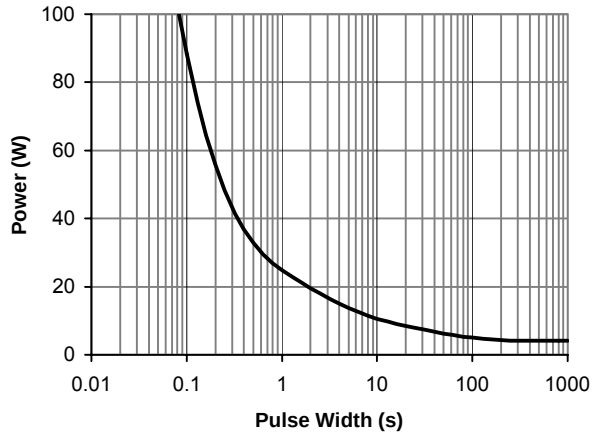


Figure 15: Single Pulse Power Rating Junction-to-Ambient (Note H)

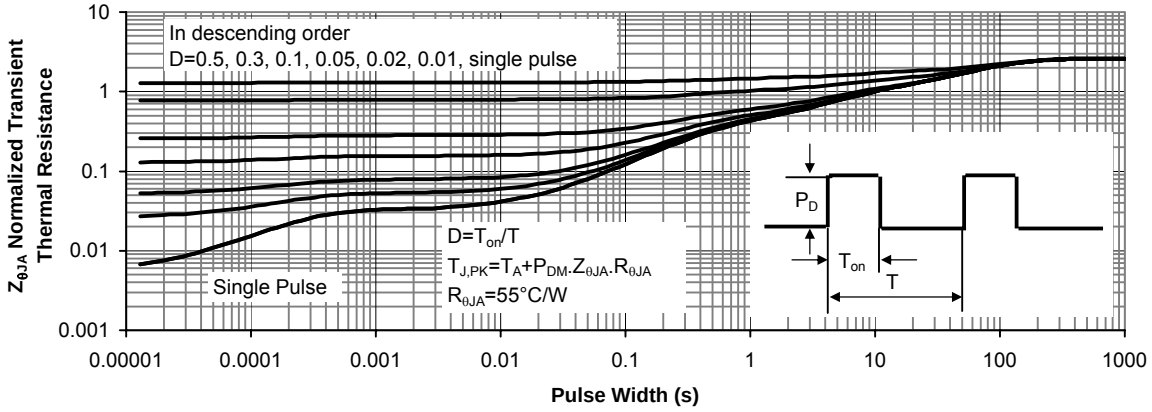


Figure 16: Normalized Maximum Transient Thermal Impedance (Note H)